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AIRPORT CAPACITY, ANALYSIS AND ENHANCEMENTS





This chapter contains an update of the airport-specific capacity studies supported by the FAA Office of System Capacity, an overview of airport development and the phases required for new runway construction, and recent initiatives to improve the project development process. It concludes with a summary of numerous capacity enhancement projects underway at the top 100 U.S. airports.

3.1 Airport Capacity Analysis

Capacity analysis is a complex process. The number and placement of runways and taxiways, the types of navigation aids, and the types of air traffic control equipment and facilities determine airport capacity. But other variables such as aircraft performance, the mix of aircraft types, pilot proficiency, weather, and runway closures affect how much of an airport's capacity can be used at a given time. The capacity in use is often less than the capacity that would be available if there were no such limitations. In addition to the Airport Capacity Benchmark Report highlighted in Chapter One, the FAA's Office of System Capacity (ASC) is involved in many other efforts to analyze and improve the performance of our nation's airports.

ASC is part of the FAA's Air Traffic Services (ATS) organization. The mission of ATS is to serve its customers and work proactively to meet their needs by directing, coordinating and ensuring the safe and efficient utilization of the (NAS). In support of this mission, ASC improves system efficiency by identifying and evaluating initiatives with the potential to increase capacity in the NAS. Among its many responsibilities, ASC supports Airport Capacity Design Teams. These teams evaluate alternatives for increasing capacity at specific airports that are experiencing or projected to experience significant flight delays. Capacity studies are a crucial element in attaining funding for airport development projects. ASC also serves on teams investigating other airport capacity enhancements and participates in air traffic control simulations at the request of local and regional Air Traffic representatives and foreign airport operators.

3.2 Airport Capacity Design Team Studies

A typical Airport Capacity Design Team includes FAA representatives from ASC, Air Traffic, the Technical Center and the Office of Airports for the appropriate region, and representatives from the airport operator, airlines, and other aviation interests. Design Team members propose actions to improve airport capacity and the FAA Technical Center's NAS Advanced Concepts Branch conducts computer simulations of the most promising alternatives. The output of the simulation is an analysis of the impact of each alternative on the operation of the airport.

Upon completion of its study, the Airport Capacity Design Team issues a Capacity Enhancement Plan (CEP) that presents a list of recommended actions and estimates of the impact of each alternative on delays at that airport. Because of possible changes in airport activity forecasts and other factors incorporated in the baseline period of the initial study, recommendations frequently require additional study before they can be implemented. However, over the years, a large number of Design Team recommendations have been adopted by the airport operators, funded by the FAA and other sources, and implemented.

Over 50 Airport Capacity Design Team studies have been completed and CEPs published since 1988. Appendix C lists completed CEPs, their recommendations, and the status of those recommendations (whether they were or were not implemented). Most recently, ASC completed a study for Portland International Airport. In conjunction with the Airport Capacity Benchmark Report, ASC is also focusing on the eight most delayed airports in the U.S., referred to as pacing airports, and is also participating on the Chicago O'Hare Delay Task Force. These and other ASC projects are summarized briefly in this chapter.

3.2.1 Portland International Airport

Portland International Airport ranked 30th in aircraft operations according to the 1999 baseline data, is forecast to experience a 37.9 percent increase in operations by 2011. Based on that forecast, the Portland International Airport Capacity Design Team conducted an update of its 1996 Capacity Enhancement Plan. There were two goals of the study. The first goal was to identify and evaluate technical challenges posed by developing a third parallel runway with associated taxiways, and constructing an additional terminal or expanding the existing terminal. The second goal was to determine what capacity and delay reduction benefit, if any, a new parallel runway would provide. Operational improvements were also considered. The study was released in October 2001. The study will be published on the ASC website, and the findings will be summarized in the 2002 ACE Plan.

3.2.2 Chicago O'Hare Task Force

The Aviation Department of the City of Chicago formed the O'Hare Delay Task Force, the second team assembled since 1991, to identify the means for reducing airline delays. The task force will focus on technology improvements, air traffic procedures, and airline decision-making during inclement weather.

3.3 Additional Airport Capacity Activities

ASC is currently a participant in capacity-enhancement projects involving Dallas/Fort Worth International, Baltimore-Washington International and Washington Dulles International airports.

3.3.1 Dallas/Fort Worth International Airport

As of the baseline study period of July 1999, regional jets represented just five percent of the commuter fleet at Dallas/Fort Worth International Airport. The FAA forecasts their numbers to increase significantly as turboprops are replaced, placing additional demand on current jet runways and route structures.

The DFW Airfield Capacity Design Team is currently conducting Phase III of its Airfield Capacity Enhancement Study, a RJ Impact Assessment, to estimate the effect of increased RJ operations under existing airport procedures. The assessment showed an increase in departures on runways 18L and 17R, leading to taxi-in delays for arriving aircraft and taxi-out and ground delays for departing aircraft. Phase IV of the study will review the impact of various capacity enhancement options on the delays and other impacts of the growth of RJ operations.

3.3.2 Baltimore-Washington International Airport

Baltimore-Washington International Airport, now ranked 25th based upon enplanements, is one of the fastest growing airports in the NAS. The FAA forecasts operations at BWI to increase by 36 percent by 2011. Planned improvements potentially include a new runway that, if constructed, will not be operational until 2010 at the earliest. When the new runway is complete, runway 4/22 will be converted to a taxiway. Operations at BWI will be evaluated during Phase III of the Northeast Regional Capacity Design Study. The Design Team has been working with the Volpe National Transportation Center on this effort.

3.3.3 Washington Dulles International Airport

Washington Dulles International Airport is also among the fastest growing airports in the NAS, with operations expected to grow by 37 percent by 2011. Several airport improvements are under consideration. A north-south parallel runway, 1W/19W, would be located west of the existing parallels and north of runway 12/30. Its estimated opening date is 2008. A second parallel runway, 12R/30L, has been proposed for a location southwest of runway 12/30, with expected completion beyond 2010. When completed, these runways may provide triple independent parallel approach capability.

3.3.4 Air Traffic Control Ground Simulations

ASC is participating in an air traffic control ground simulation at Phoenix Sky Harbor International Airport. In addition, because of the FAA's recognized expertise in evaluating capacity enhancements, foreign airport operators have requested assistance. Beginning last year, Ben Gurion International Airport in Tel Aviv, Israel began using the FAA's expertise to improve the operational efficiencies at the airport. Both these studies are utilizing the Technical Center's Airfield Delay Simulation Model (ADSIM) and the Airspace Delay Simulation Model (SIMMOD) to analyze various airfield configurations and to determine daily total aircraft travel times and ground delays.

3.3.5 Phoenix Sky Harbor International Airport

An initiative to assist air traffic controllers with ground operations efficiency was recently conducted at Phoenix Sky Harbor International Airport. The goal was to determine a more efficient use of runways for arrival and departure operations, based on the present runway configuration and several proposed alternate configurations during the construction of a third runway as well as the subsequent reconstruction of the existing runways. This initiative was completed in 2001. The study will be published on the ASC website, and the findings will be summarized in the 2002 ACE Plan.

3.3.6 Ben Gurion International Airport

The Israel Airports Authority asked the Office of System Capacity, to conduct an analysis of the airspace, airfield, and procedural operations at Ben Gurion International Airport, to assist in making recommendations and to analyze those recommendations through simulation modeling. The study was requested because the airport was experiencing annual growth rates of greater than 10 percent. The primary airspace recommendation was to create a more efficient northern arrival route to replace the present route from the west.

Extension of Runway 3/21 to accommodate northern arrivals, new parallel taxiways, high-speed exits, and a new terminal traffic flow were the primary airfield recommendations. Suggested procedural changes included a reduction in the separation standard from five to three miles and simultaneous arrival/departure procedures. The study was released in June 2001.

3.4 Airport Development

This past year there has been increasing focus on new runways as one piece of the aviation congestion solution. While the tragic events of September 11 have reduced system traffic demand by 15%, we must keep in mind that construction of a new runway takes approximately ten years or longer to complete. Efforts by the FAA for streamlining the Federal regulatory process include reducing the time required for project planning and completing environmental reviews. Although new runways are not an option for some airports, new runway construction provides the most significant potential for capacity enhancement.

The following section gives a brief overview of the planning process and timeline for an airport runway project. To give further insight into the complexities and challenges of this process, two very critical phases of the project, the EIS and airport funding are described in further detail. When a project takes longer to complete than planned, there is significant subsequent impact to the costs of the project.

3.4.1 Overview of A New Runway Project

There are several critical activities that occur within each major phase of the runway project development cycle, following is a brief summary of the significant activities occurring within each phase shown in Figure 3-1:

During the Project Planning phase, the airport layout plan is prepared graphically depicting the location of future airport facilities. The Airport Layout Plan (ALP) serves as a record of aeronautical requirements and is used by the FAA in its review of proposals involving the development that may affect the navigable airspace or other missions of the FAA. The appropriate FAA office must have reviewed and approved the location, type, dimension and construction material all proposed for development. Other important areas such as airspace interaction, potential ATC and navaid impacts and obstruction evaluation are reviewed. The development of terminal instrument procedures (TERPs) is initiated at this time. Additionally, capacity/delay analysis economic feasibility and risk analysis may be required.

The Justification and Challenges phase includes land acquisition, the environmental assessment process or environmental impact statement (EIS), Improvement Plan, airport capital plan update, benefit/cost analysis and approval. The EIS aspect is being scrutinized to reduce processing time, and it is discussed in detail later in this chapter.

Litigation/Resolution often results from the outcome of previous project phases, from groups that continue opposing a runway development project. Litigation and resolutions may further delay a project from its initial timeline, as well as the delay itself making many studies obsolete and subsequently requiring that new studies be conducted.

During the FAA Funding Process, major activities include determining the project's financial feasibility, and securing Federal aid, such as AIP and PFCs, a Letter of Intent (LOI) is executed and bond issuances are completed.

Under Project Design, project engineering takes place and the FAA reimbursable Agreement is completed.

Project Construction, or the final project phase, includes land acquisitions and the actual physical building of the runway project, and can be impacted by numerous financial factors. Unanticipated changes in sources of an airport's revenue such as the impact of September 11th, is one example of an event that can delay a project. Also, seasonality has an impact on projects when weather changes a project's original timeline.

There are approximately 40 Federal laws, executive orders and regulations protecting particular parts of the environment, in addition to state laws that are part of the airport project review process. Most major airport changes that require FAA approval also require preparation of an environmental assessment (EA) or an environmental impact statement (EIS). Examples of major airport changes requiring environmental assessment include the proposed construction of a new runway, runway extension, runway strengthening the installation of instrument landing systems, and significant airspace changes. If environmental mitigation measures can be identified that would reduce the environmental impacts below significant thresholds, the FAA can issue a finding of no significant impact (FONSI) and complete the environmental process. If significant environmental impacts are determined from the assessment, the FAA must prepare the EIS. In some instances, due to the extent of the environmental impacts that would result from the proposed airport project, the FAA determines that an EIS is required and proceeds with preparing an EIS rather than starting an EA.

Figure 3-1 Phases of a New Runway Project, from Planning through Completed Construction

| Major Cycles | Years ➤ | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------------------------------------|---------|---|---|---|---|---|---|---|---|---|----|
| Project Construction | | | | | | | | | | | |
| Project Design | | | | | | | | | | | |
| FAA Funding Process | | | | | | | | | | | |
| Litigation/Resolution | | | | | | | | | | | |
| Justification and Challenges | | | | | | | | | | | |
| Environmental Process (usually EIS) | | | | | | | | | | | |
| Project Planning | | | | | | | | | | | |

3.4.2 Improving the EIS Review Process

AIR-21, which was approved last year, requested that the DOT conduct a study of Federal environmental requirements related to the planning and approval of the airport improvement process. Subsequently, the FAA collaborated with the aviation industry to develop a plan to reduce the time required to build new runways or extend existing runway configurations. An industry sponsored plan for streamlining the EIS review process, called the Expedited Aviation System Enhancement (EASE) Plan, is supported by the American Association of Airport Executives, Airports Council International-North America and the

Airport Consultants Council. The FAA reviewed the EASE Plan, and released six initiatives in May 2001 in its Report to Congress.

3.4.3 FAA Environmental Initiatives

The EIS process cannot be cleanly segregated from the overall planning process. In some cases, new planning data or changes in a project during the process of an EIS cause its timeline to be extended. The DOT seeks to reduce undue delays while maintaining the integrity of the environmental process and complying with all environmental protection requirements.

In May 2001, the FAA identified six initiatives resulting from industry-wide input designed to reduce environmental delays. The guide was released in July 2001.

1 *Establishment of an EIS Team for each new EIS for a major runway project at a large hub primary airport.*

Teams will be strengthened by adding more FAA members, airport proprietors will be asked to contribute more members, and the use of additional consultants will increase resources.

2 *Reallocation of FAA staff resources.*

In FY 2001, five more positions in FAA's Airports Office will convert to environmental positions. A reimbursable funding option allows airports to pay for additional FAA staff.

3 *Maximize consultant resources to perform more EIS tasks.*

This includes providing direct assistance to the FAA project manager, and supporting research and briefing papers.

4 *Streamline the environmental process and product.*

By using more categorical exclusions and shortening and streamlining an EIS or Environmental Assessments/Findings of No Significant Impact (EA/FONSI), time can be saved.

5 *Improve interagency cooperation and coordination.*

This applies to an EIS for airport projects and for the issuance of environmental permits. Heads of other agencies and staff at the regional interagency levels within the FAA will be briefed on the national importance of airport capacity and of the importance of intergovernmental cooperation to avoid unnecessary delays. Greater flexibility and the early involvement of other agencies at the very beginning is another improvement.

6 Compile and Issue the FAA Guide to the Best Practices For Environmental Impact Statement Management.

An Environmental Impact Statement is a Federal responsibility; therefore the primary responsibility for the management of an EIS for airport development rests with the FAA. In addition to the measures initiated by the FAA in collaboration with the aviation industry, legislation is being proposed that would help to reduce the time required to complete an EIS. Proposed laws, such as the Aviation Delay Prevention Act, requires that airports complete a planning and review process for runways in five years.

3.5 Resources For Airport Development

There are generally five resources used to finance airport development, which include airport cash flow, revenue and general obligation bonds, Airport Improvement Program (AIP) grants, Passenger Facility Charges (PFCs), and state and local funding programs. Public grants, PFCs, and airport revenue bonds provide most of the capital funding, while user charges generally cover an airport's operating expenses and the debt service for airport bonds.

Airport revenue is generated from a combination of public and private sources. Private funding for an airport includes the services airlines pay for, such as the rates and charges for landing fees, terminal rents and support facility fees. Also, concession revenues are generated from food and beverage, retail and service businesses located within the terminal, and outdoor car rental and parking facilities. Publicly funded sources are those monies obtained through Federal, state and local grants.

3.5.1 Airport Improvement Program

The Airport Improvement Program (AIP) is administered by the FAA, and plays a critical role in maintaining and expanding our nation's airport infrastructure. The AIP provides federal grants for eligible airport development and planning for capital projects that support airport operations, including runways, taxiways, aprons, and noise abatement. Airport sponsors and non-federal contributors must provide that portion of the total project cost that is not funded with AIP grants. The passage of AIR-21 provided for a substantial increase in AIP funds through the year 2003 to as much as \$3.4 billion.

3.5.2 Passenger Facility Charges (PFCs)

With the passage of AIR-21, the maximum passenger facility charge that airports can impose on each boarding passenger was increased from \$3.00 to \$4.50. The increased funding stream from the higher PFCs will result in critical airport infrastructure being completed sooner. PFCs are a significant source of capital improvement for large, medium, small and non-hub commercial airports. As of 2000, over 300 commercial service airports had PFC approval.

3.5.3 User Charges

Airport user charges include aircraft landing fees; apron, gate-use, or parking fees; fuel-flowage fees; and terminal charges for rent or use of passenger hold rooms, ticket counters,

baggage claims, administrative support, hangar space, and cargo buildings. Non-airport user charges include revenue from sources such as terminal concessionaire rentals and fees, automobile parking and interest income.

3.5.4 Bonds: Revenue, General Obligation and Special Facility

The issuance of bonds remains the primary means of financing airport development projects at commercial service airports. Bond debt service for interest, capital, and other costs is a major component of airport user charges. Most airport bond financing has used tax-exempt general airport revenue bonds (GARBs).

Terminal facilities have also been financed with special facility bonds. The introduction of PFCs as an additional source of funds has led to the evolution of a version of the GARB that relies partially or totally on PFC revenues for repayment. Because of the conservative nature of the tax-exempt bond market, these PFC-backed bonds often require special commitments from the FAA to reduce the likelihood of any bond default resulting from some federal actions that could affect future PFC collections.

3.5.5 Other Sources of Funding

State and local governments have contributed to the development and operation of community airports, offering matching grants to secure federal support, providing direct grants to fund airport maintenance projects, and financing the installation of navigation aids. To expand air service and to encourage competition, state and local governments have also supported airport marketing initiatives. Private sources of funding may also be available through airport tenants, third-party developers and other private entities.

3.6 Construction of New Runways, Extensions, Taxiways, and Aprons

Although new runways are not an option for some airports, new runway construction provides the most significant potential for capacity enhancement. A number of the busiest airports have completed new runways or other runway construction projects in the last six years. Figure 3-2 shows that eight new runways were opened from January 1996 to October 2001. Another 21 runway construction projects were completed from January 1996 through October 2001, including 16 runway extensions, one renovation, two reconstructions, and two realignments.

Figure 3-2 Completed Runway Construction Projects January 1996 to October 2001

| Airport (ID) | New | Extension | Renovation | Reconstruction | Realignment | Year | Runway |
|--|-----|-----------|------------|----------------|-------------|------|---------|
| Anchorage International (ANC) | | • | | | | 1996 | 32 |
| Port Columbus International (CMH) | | • | | | | 1996 | 28R |
| Dallas/Fort Worth International (DFW) | • | | | | | 1996 | 17L/35R |
| Milwaukee General Mitchell International (MKE) | | | | | • | 1996 | 7L/25R |
| Minneapolis-St. Paul International (MSP) | | • | | | | 1996 | 4/22 |
| Omaha Eppley Airfield (OMA) | | • | | | | 1996 | 14R/32L |
| Austin-Bergstrom International (AUS) | | | • | | | 1997 | 17R/35L |
| Boise Air Terminal (BOI) | | • | | | | 1997 | 10L/28R |
| Port Columbus International (CMH) | | • | | | | 1997 | 10L |
| Grand Rapids Kent County International (GRR) | | • | | | | 1997 | 18/36 |
| Indianapolis International (IND) | • | | | | | 1997 | 5L/23R |
| Las Vegas McCarran International (LAS) | | | | • | | 1997 | 1L/19R |
| Chicago Midway (MDW) | | | | • | | 1997 | 4R/22L |
| Louisville International (SDF) | • | | | | | 1997 | 17R/35R |
| Grand Rapids Kent County International (GRR) | | | | | • | 1998 | 17/35 |
| Little Rock Adams Field (LIT) | | • | | | | 1998 | 4L/22R |
| Memphis International (MEM) | • | | | | | 1998 | 18L/36R |
| Milwaukee General Mitchell International (MKE) | | • | | | | 1998 | 7L/25R |
| Madison/Dane County Regional (MSN) | • | | | | | 1998 | 3/21 |
| Palm Springs Regional (PSP) | | • | | | | 1998 | 31L/13R |
| Albuquerque International (ABQ) | | • | | | | 1999 | 12/30 |
| Austin-Bergstrom International (AUS) | • | | | | | 1999 | 17L/35R |
| Greenville-Spartanburg (GSP) | | • | | | | 1999 | 3L/21R |
| Philadelphia International (PHL) | • | | | | | 1999 | 8/26 |
| Newark International (EWR) | | • | | | | 2000 | 4L/22R |
| Memphis International (MEM) | | • | | | | 2000 | 18C/36C |
| Phoenix Sky Harbor International (PHX) | • | | | | | 2000 | 7/25 |
| Palm Beach International (PBI) | | • | | | | 2000 | 9L/27R |
| San Jose International (SJC) | | • | | | | 2000 | 12L/30R |

The busiest 100 airports also have a large number of runway construction projects in progress or in the planning stage. Figure 3-3 lists runway projects with planned operational dates between November 2001 and December 2006. Thirty-three of the 100 busiest airports have projects in the pipeline, including 26 new runway extensions, and three runway reconstructions. Appendix D shows additional runway construction projects proposed or planned for 2007 and beyond.

Figure 3-3 Runway Construction Projects November 2001 to December 2006.

| Airport (ID) | New | Extension | Reconstruction | Runway Identifier | Estimated Cost (\$M) | Planned Operational Year | In Progress |
|---|-----|-----------|----------------|-------------------|----------------------|--------------------------|-------------|
| Des Moines International (DSM) | | • | | 5/23 | \$31.0 | 2001 | • |
| Detroit Metropolitan Wayne County (DTW) | • | | | 4/22 | \$116.5 | 2001 | • |
| El Paso International (ELP) | | • | | 4/22 | \$8.0 | 2001 | • |
| Kahului (OGG) | | • | | 2/20 | \$47.0 | 2001 | |
| Phoenix Sky Harbor International (PHX) | | • | | 8L/26R | \$7.0 | 2001 | • |
| Albany County (ALB) | | • | | 10/28 | \$5.8 | 2002 | |
| Birmingham (BHM) | | • | | 5/23 | \$17.0 | 2002 | |
| Dayton International (DAY) | | • | | 6R/24L | TBD | 2002 | |
| Dallas/Fort Worth International (DFW) | | • | | 18L/36R | \$50.0 | 2002 | • |
| George Bush Intercontinental (IAH) | | • | | 15R/33L | \$100.0 | 2002 | |
| Manchester (MHT) | | • | | 6/24 | \$120.0 | TBD | • |
| Pensacola Regional (PNS) | | • | | 8/26 | \$12.3 | 2002 | |
| Sarasota Bradenton (SRQ) | | • | | 14/32 | \$5.1 | 2002 | |
| Cleveland Hopkins International (CLE) | • | | | 5W/23W | \$467.0 | 2003 | |
| Denver International (DEN) | • | | | 16R/34L | \$167.0 | 2003 | • |
| Dallas/Fort Worth International (DFW) | | • | | 18R/36L | \$400.0 | 2003 | |
| George Bush Intercontinental (IAH) | • | | | 8L/26R | \$260.0 | 2003 | • |
| Orlando International (MCO) | • | | | 17L/35R | \$203.0 | 2003 | • |
| Miami International (MIA) | • | | | 8/26 | \$206.0 | 2003 | • |
| San Jose International (SJC) | | • | • | 12R/30L | \$61.4 | 2003 | |
| Charlotte-Douglas International (CLT) | • | | | 18W/36W | \$187.0 | 2004 | |
| Greensboro Piedmont Triad International (GSO) | • | | | 5L/23R | \$96.0 | 2004 | |
| Minneapolis-St. Paul International (MSP) | | • | | 4/22 | \$11.4 | 2004 | |
| Minneapolis-St. Paul International (MSP) | • | | | 17/35 | \$563.0 | 2004 | • |
| Norfolk International (ORF) | • | | | 5R/23L | \$100.0 | 2004 | |
| Knoxville McGhee-Tyson (TYS) | | • | | 5L/23R | \$7.0 | 2004 | |
| Albany County (ALB) | | • | | 1/19 | \$7.5 | 2005 | |
| Hartsfield Atlanta International (ATL) | • | | | 10/28 | \$1,200.0 | 2005 | • |
| Boston Logan International (BOS) | • | | | 14/32 | \$95.0 | 2005 | |
| Greater Buffalo International (BUF) | | • | | 14/32 | \$4.9 | 2005 | |
| Greater Cincinnati-Northern Kentucky Intl (CVG) | • | | | 17/35 | \$233.0 | 2005 | • |
| Greater Cincinnati-Northern Kentucky Intl (CVG) | | • | | 9/27 | \$18.2 | 2005 | |
| Dallas/Fort Worth International (DFW) | | • | | 17C/35C | \$25.0 | 2005 | |
| Fort Lauderdale-Hollywood International (FLL) | | • | | 9R/27L | \$898.0 | 2005 | |
| Lubbock International (LBB) | | • | | 8/26 | \$15.0 | 2005 | |
| Manchester (MHT) | | • | • | 17/35 | \$65.0 | 2005 | • |

Figure 3-3 continued

| Airport (ID) | New | Extension | Reconstruction | Runway Identifier | Estimated Cost (\$M) | Planned Operational Year | In Progress |
|---------------------------------------|-----|-----------|----------------|-------------------|----------------------|--------------------------|-------------|
| Cleveland Hopkins International (CLE) | | • | | 5R/23L | \$40.0 | 2006 | |
| San Antonio International (SAT) | | • | | 3/21 | \$20.0 | 2006 | |
| San Antonio International (SAT) | | • | • | 12L/30R | \$11.0 | 2006 | |
| Seattle-Tacoma International (SEA) | • | | | 16W/34W | \$773.0 | 2006 | |
| St. Louis-Lambert International (STL) | • | | | 12R/30L | \$1,100.0 | 2006 | |

3.7 Capacity Enhancements Through New and Converted Airports

Airport development frequently entails the construction of new terminals, new and extended runways, and improved taxiway systems. In large metropolitan areas with frequent flight delays and limited airport expansion possibilities, other options must be explored. New airports, expanded use of existing commercial service airports, and civilian development of former military bases are options available for meeting expanding aviation needs.

While the construction of new airports provides the largest and most significant increase in aviation system capacity, there are several reasons why few new airports have been built in recent decades. These considerations include the high cost of construction, the large acquisition and use of land, the environmental impact of an airport, and whether or not there is sufficient competitive market demand for the proposed air service. Among primary airports, only two new hub airports have been built in three decades: Denver International was completed in 1995 and Dallas/Fort Worth International in 1974. The two primary non-hub airports that have been most recently completed are Northwest Arkansas Regional Airport and Mid-America Airport which both opened in 1998. Mid-America is the St. Louis region's second major airport and serves as a reliever airport for Lambert-St. Louis International Airport and as a joint use facility with Scott Air Force Base.

Currently, several regions are proposing a study or have one underway to determine the feasibility of constructing new regional airports. Another vehicle for capacity enhancement is the Military Airport Program (MAP), which provides grants to current or former military airfields with the potential to improve the capacity of the NAS. These airfields include Base Realignment and Closure (BRAC) participants, and airfields that have entered joint-use agreements to accommodate civil and military users. Many of these airfields are located near congested metropolitan areas and have the potential to provide capacity. The most significant conversion of a military airfield under the Military Airport Program (MAP) has been the conversion of Bergstrom Air Force Base, Austin, Texas, into a civilian airport, Austin-Bergstrom International, which opened May 1999. Bergstrom is a replacement for Robert Mueller Municipal Airport, and, as is the case with Northwest Arkansas Regional airport, these facilities have shown growth in the number of enplanements significantly above the national average. Another MAP conversion took place at Alexandria Esler Regional Airport, which replaced Esler Field, in Louisiana.

3.8 Capacity Enhancement Through Intermodal Solutions

In addition to the capacity enhancements obtained through airport development, improvements to the U. S. transportation system are being achieved through intermodal solutions. Several DOT initiatives are now underway.

3.8.1 Department of Transportation Initiatives

The Department of Transportation (DOT) has undertaken several funding initiatives contained in the Transportation Equity Act for the 21st Century (TEA-21, P.L. 105-178) to improve passenger access to the U.S. aviation system. These initiatives involve the FAA but are administered by DOT. Examples of such initiatives include cooperation between the Federal Transit Authority, Federal Railroad Administration (FRA) and the FAA in developing light rail transit systems for JFK International in New York, Lambert Field in St. Louis, and other airports. In addition, the FRA is exploring the option of high-speed trains as alternatives to air, highway, or conventional train transportation in certain congested areas.

3.8.2 FRA High Speed Ground Transportation Initiative

The daunting transportation problems of congestion, air and noise pollution in the air and on highways continue to rise as more citizens rely on the national transportation infrastructure. As a result, exploring alternative means of transportation becomes increasingly important. One such alternative is high-speed ground transportation (HSGT), which includes both high-speed rail and magnetic levitation (Maglev). Maglev trains float on air, eliminating friction. This, coupled with the train's aerodynamics allows unprecedented ground transportation speeds of more than 300 miles per hour (500 kilometers per hour).

Maglev Project Semi-Finalists

Of seven candidates for a \$950 million Maglev deployment program, Pennsylvania's Pittsburgh project and Maryland's Baltimore-Washington project were selected as semi-finalists.

Pennsylvania

The 47-mile project links Pittsburgh International Airport with downtown Pittsburgh and the eastern suburbs of Monroeville and Greensburg. The route eventually could extend to Philadelphia. The project has been under study since 1990 and is proposed by the Port Authority of Allegheny County, with the support of state and local agencies, labor unions and community coalitions.

Maryland

The 40-mile project would link Camden Yards in Baltimore (a sport complex and center for recreation and tourism) and the Baltimore-Washington International Airport to Union Station in Washington, DC. This project has been under study since 1994. Proposed by the Maryland Department of Transportation (MDOT), this proposed transportation link between sports venues would support a bid for the 2012 Olympic games.